

The TCEQ requires developments on the Recharge and Contributing Zones to control discharge of pollution after construction either through the use of structural best management practices such as sedimentation/filtration basins, or by limiting the impervious cover to less than 20 percent of the site.

In addition to and above and beyond the requirements of the TCEQ, the COSA Agreement stipulates additional water quality protection measures that will regulate the quality of storm water on-site as well as storm water runoff leaving the Property from the golf course construction and operation. In addition, the COSA Agreement limits the amount of water utilized by the Proposed Alternative and requires all water to be supplied and controlled by SAWS. Surface water and groundwater quality monitoring conducted on site, will identify potential concerns from a golf village golf course construction and operation that can then be addressed by land management practices to prevent on-site and off-site impact to water quality, per the COSA Agreement.

#### **5.1.4.10 Socioeconomic Environment**

The Proposed Alternative will contribute to the increase in population and traffic in northern Bexar County, which will, over time, become even more urbanized as new development continues to occur. The Proposed Alternative will also result in an increase in jobs in the area (See Section 5.1.1.10). This alternative may also result in an increase in supportive businesses such as stores and restaurants. There may also be an increase in the need for road repairs and other public services in the area, along with an increased tax base.

### **5.2 Alternative Two – Existing, approved Full Development Plan on Evans Road Tract with Wolverton Tract and The North Triangle Tract**

#### **5.2.1 Direct Impacts**

Disturbances resulting from the development and construction of Master Phase II will disturb vegetation on-site and reduce habitat for wildlife, including the destruction and modification of GCWA habitat. Implementation of Alternative Two is expected to offset a portion of such impacts through avoidance and/or minimization efforts in some steep canyon areas identified as GCWA habitat.

##### **5.2.1.1 Vegetation**

Alternative Two would remove, alter, or further fragment approximately 1,535 acres (621 hectares) of vegetation. Within the Development Area, native vegetation will be modified and replaced with homes, structures of various sorts, and landscaped areas. Landscaping will be performed with native vegetation.

##### **5.2.1.2 Wildlife**

Wildlife within those areas planned for development would largely be displaced to adjacent areas. Such displacement could result in increased competition for breeding, nesting, and foraging habitat, as well as cover, in adjacent undisturbed habitat. Outside of designated open space, the

promotion of urban wildlife species and human activities related to the proposed development may result in the decline of more specialized species in general.

The approximate 1,535 acres of disturbed vegetation containing areas of GCWA habitat would be mitigated for. Mitigation would occur off-site, so that existing on-site GCWA habitat could be impacted by development.

#### **5.2.1.3 Threatened or Endangered Species**

##### **Golden-cheeked Warbler**

The Service believes the entire Property provides habitat for the GCWA. This is further discussed in Section 5.1.1.3. Alternative Two is expected, over time, to result in clearing of 1,535 acres of GCWA habitat. The encroachment of noise and other activities within close proximity to GCWA habitat, along with the introduction or increase of predator species (e.g., scrub jays, cats), and increase of species that may compete with the GCWAs for shelter, forage and nesting resources (such as brown-headed cowbirds) are potential indirect impacts of adjacent development. Alternative Two would affect approximately 1,535 acres of varying quality GCWA habitat. Upon completion of Alternative Two, the viability of all GCWA habitat within the Cibolo Canyon Property is uncertain. Therefore, these potentially impacted GCWA habitat areas would be mitigated off-site.

##### **Black-capped Vireo**

Habitat evaluations conducted by Horizon and aci concluded that the vegetation of the Property lacks the requisite shrub density and shrub species regularly occupied by the BCVI (aci, 2002a). No impacts to the BCVI are expected as a result of Alternative Two. The Applicant has not requested take coverage for the BCVI and none would be granted by issuance of the permit. No Critical Habitat has been designated for this species, therefore, none will be impacted.

##### **Karst Invertebrates**

The Property is located in the Stone Oak karst fauna region. Of the nine endangered karst or cave-dwelling invertebrates known to occur in Bexar County, three species are known to occur in Stone Oak karst fauna region. The Property is not designated by the Service as Critical Habitat for any of the endangered karst invertebrates. Extensive karst surveys of the Property have not revealed the presence of any endangered karst invertebrate habitat or species (see Section 3.5 and 5.1.1.3).

##### **Edwards Aquifer Species**

The Service has expressed concern that the combined current level of water withdrawal for all consumers from the Edwards Aquifer could adversely affect aquifer-related species located at Comal, San Marcos, Fern Bank, and Hueco Springs during low flows, and that effects on the Aquifer may also affect the Cagle's map turtle (*G. caglei*) (a candidate for listing). Regional efforts are expected to address the potential impacts to aquifer-related species from water withdrawals (see Section 3.3.3).



#### **5.2.1.3.1 Assessment of Take**

Alternative Two is expected to result in development of 1,517 acres (614 hectares) of the overall 1,606 acres. Upon completion of Master Phase II, the viability of GCWA habitat within developed areas of the Property is uncertain for the reasons stated in Section 5.1.1.3.1. Therefore, this modified GCWA habitat will be mitigated off-site.

#### **5.2.1.3.2 Assessment of Take of Other Listed Species**

The Property has been evaluated for the federally-listed threatened or endangered species discussed under Section 3.3 above. Other than evidence of use of portions of the Property by the GCWA, there is no evidence of any use by any other threatened or endangered species on the Property (see Sections 3.3.1, 3.3.2, 3.3.3, and 5.1.1.3). It appears that no listed species, other than the GCWA, are likely to be present on or adjacent to the Property, and therefore, it is unlikely that any such species will be taken or affected by development and operation of Alternative Two.

#### **5.2.1.4 Wetlands**

Impacts to wetlands would be similar to those described under the Proposed Alternative.

#### **5.2.1.5 Geologic Features and Soils**

Impacts to geologic features and soils would be similar to those described under the Proposed Alternative.

#### **5.2.1.6 Land Use**

New development on the Property will consist of commercial and residential development. The proposed action is comparable and compatible with current land use in the area. Under Alternate two, no open space would be created in conservation easements but approximately 100 acres of park and recreational areas would be created.

#### **5.2.1.7 Cultural Resources**

All archaeological sites will be directly impacted. However, the sites have very little research value and represent negligible cultural resources. No sites that are eligible or potentially eligible for the National Register of Historic Places will be impacted.

#### **5.2.1.8 Air Quality**

Impacts to air quality would be similar to those described under the Proposed Alternative.

#### **5.2.1.9 Water Resources and Water Quality**

Impacts to water resources and water quality would be similar to those described under the Proposed Alternative in 5.1.1.9 except that, annual water demand for Alternative Two is estimated to be 8,711 equivalent dwelling units or 2,613,300 gallons per day (average flow).

#### **5.2.1.10 Socioeconomic Environment**

The proposed development, construction, and occupation of the Property would result in construction and operation of residential development with attendant roads and utilities on almost all portions of the Property. Development of this Property would provide additional residential areas.

Socioeconomic benefits in the form of construction jobs will occur when the project is being developed. Additional benefits in the form of increased tax base would result from development of Alternative Two. The projected property value to be taxed in 15 years is estimated to be \$543,600,000. This results in estimated annual tax revenues in 15 years for the COSA, school districts, Bexar County, and the Hospital District of approximately \$16,308,000 in property taxes. The estimated annual tax revenue in 25 years is approximately \$27,718,000 in property taxes.

#### **5.2.2 Indirect Impacts**

##### **5.2.2.1 Vegetation**

Indirect impacts to vegetation would be similar to those described under the Proposed Alternative.

##### **5.2.2.2 Wildlife**

Indirect impacts to wildlife would be similar to those described under the Proposed Alternative.

##### **5.2.2.3 Threatened or Endangered Species**

Indirect impacts to threatened or endangered species would be similar to those described under the Proposed Alternative.

##### **5.2.2.4 Wetlands**

Indirect impacts to wetlands would be similar to those described under the Proposed Alternative.

##### **5.2.2.5 Geologic Features and Soils**

Indirect impacts to geologic features and soils would be similar to those described under the Proposed Alternative.

##### **5.2.2.6 Land Use**

Indirect impacts to land use would be similar to those described under the Proposed Alternative.

Alternative Two will increase traffic on area roadways. At full build-out, this Alternate is projected to result in peak hour traffic of 7,124 AM peak hour trips and 8,888 PM peak hour trips with a total of 83,404 daily trips. Mitigation of existing roadways and existing intersections will

be warranted and could be provided in accordance with the COSA Traffic Impact Analysis Ordinance.

#### **5.2.2.7 Cultural Resources**

Indirect impacts to cultural resources would be similar to those described under the Proposed Alternative.

#### **5.2.2.8 Air Quality**

Indirect impacts to air quality would be similar to those described under the Proposed Alternative.

#### **5.2.2.9 Water Resources and Water Quality**

Indirect impacts to water resources and water quality would be similar to those described under the Proposed Alternative.

#### **5.2.2.10 Socioeconomic Environment**

Indirect impacts to socioeconomic environment would be similar to those described under the Proposed Alternative.

### **5.2.3 Cumulative Impacts Analysis**

A general overview of cumulative impacts is included as Section 5.1.3.

#### **5.2.3.1 Vegetation**

The approximate 2,585 total acres (1046 hectares) of disturbed vegetation within Master Phase I and II would contribute to the cumulative disturbance of these vegetation types in Bexar County from development and other land use changes of all kinds. The dedication of 269 acres (108.9 hectares) of open space within Master Phase I and II project areas would help minimize significant cumulative impacts to vegetation. However, this alternative would remove and/or alter more vegetation than the Proposed Alternative or Alternative three.

Under Alternative Two, the site is estimated to be 50 percent impervious cover, which represents approximately seven percent of the conversion of vegetated lands to impervious within the mapped Recharge Zone in Bexar County.

Overall tree canopy for the Property would likely be less than the recommended 45 percent tree canopy for the EARZ by American Forests (American Forests, 2003).

#### **5.2.3.2 Wildlife**

Cumulative impacts to wildlife would be similar to those described under the Proposed Alternative.



#### **5.2.3.3 Threatened or Endangered Species**

Cumulatively, the proposed action may contribute to take of the GCWA and will reduce the overall habitat in Bexar County, particularly when added to other section 10(a)(1)(B) incidental take permits that may be issued by the Service and for other developments that have not obtained authorization under the ESA.

With the exception of the GCWA, cumulative impacts to threatened or endangered species would be similar to those described under the Proposed Alternative (See Section 5.1.3.4). No endangered karst invertebrates were identified on-site nor is there any evidence that they are present on this site. No Service designated Critical Habitat for karst invertebrates exist on-site. Therefore, no cumulative impacts to karst invertebrates are anticipated as a result of Alternative Two.

#### **5.2.3.4 Wetlands**

Cumulative impacts to wetlands would be similar to those described under the Proposed Alternative.

#### **5.2.3.5 Geologic Features and Soils**

Cumulative impacts to geologic features and soils would be similar to those described under the Proposed Alternative.

#### **5.2.3.6 Land Use**

Cumulative impacts to land use would be similar to those described under the Proposed Alternative.

#### **5.2.3.7 Cultural Resources**

Cumulative impacts to cultural resources would be similar to those described under the Proposed Alternative.

#### **5.2.3.8 Air Quality**

Cumulative impacts to air quality would be similar to those described under the Proposed Alternative.

#### **5.2.3.9 Water Resources and Water Quality**

No significant cumulative impacts are expected to occur to surface water or groundwater as a result of Alternative Two. Development will be conducted in accordance with TCEQ rules for development on the Edwards Aquifer Recharge Zone. The total combined Recharge Zone and Contributing Zone acreage within Bexar County, as mapped, is estimated to be approximately 13.68 percent impervious cover, excluding the proposed action. Development of Alternative Two does not increase the overall impervious cover on the Edwards Aquifer Recharge Zone and Contributing Zone within Bexar County. The installation of structural best management

practices, using TCEQ's guidance documents for Recharge and Contributing Zones, would result in an effective impervious cover of 20 percent or less. Therefore, the use of structural controls further reduces the impact associated with the proposed action.

#### **5.2.3.10 Socioeconomic Environment**

Cumulative impacts to socioeconomic environment would be similar to those described under the Proposed Alternative.

### **5.3 Alternative Three - Low Density, Large Lot Community – No Golf or Resort**

#### **5.3.1 Direct Impacts**

Disturbances resulting from the development and construction on the Property will disturb vegetation on-site and reduce habitat for wildlife, including the destruction and modification of GCWA habitat. Implementation of Alternative Three is expected to offset a portion of such impacts through minimal avoidance and/or minimization efforts in areas identified as GCWA habitat.

##### **5.3.1.1 Vegetation**

Alternative Three would remove, alter, or fragment the vegetation on the entire Master Phase II area. Under Alternative Three, impervious cover will not exceed 15 percent. Green space will remain largely within privately owned large lots. The clearing of vegetation associated with the actual construction of Alternative Three will not cause a significant reduction of large blocks of vegetation within the region, mostly due to previous clearing in the area by others and will leave significant green space in private hands. This private property is subject to further fragmentation by subsequent owners of the land, the extent of which cannot readily be gauged, controlled, or reliably enforced.

##### **5.3.1.2 Wildlife**

Direct impacts to wildlife would be similar to those described under the Proposed Alternative.

##### **5.3.1.3 Threatened or Endangered Species**

Alternative Three has been evaluated for the federally-listed threatened or endangered species discussed under Section 3.3 above. Other than evidence of potential use of the Property by the GCWA there is no evidence of any other threatened or endangered species on Master Phase II (see Sections 3.3.1, 3.3.2, 3.3.3, and 5.1.1.3). It appears that no listed species, other than the GCWA are likely to be present on or adjacent to Master Phase II, and therefore, it is unlikely that any such species will be taken or affected by development and operation of Alternative Three, nor, therefore, any of the alternatives.

##### **Golden-cheeked Warbler**

The Service believes the entire Property provides habitat for the GCWA. This is further discussed in Section 5.1.1.3. The COSA-approved development of the high density plan (by

COSA) allows development of the entire Property. Alternative Three is also expected, over time, to result in clearing of 1,517 acres of GCWA habitat. The encroachment of noise and other activities within close proximity of GCWA habitat, along with the introduction or increase of predator species (e.g., scrub jays, cats), and increase of species that may compete with GCWA for shelter, forage, and nesting resources (such as brown-headed cowbirds) are potential indirect impacts of adjacent development. Upon completion of Alternative Three, the viability of all GCWA habitat within the Cibolo Canyon Property is uncertain. Therefore, these potentially impacted GCWA habitat areas would be mitigated off-site.

#### **Black-capped Vireo**

Habitat evaluations conducted by Horizon and aci concluded that the vegetation of the Property lacks the requisite shrub density and shrub species regularly occupied by the BCVI (aci, 2002a). No impacts to the BCVI are expected as a result of Alternative Three.

#### **Karst Invertebrates**

The Property is located in the Stone Oak karst fauna region. Of the nine endangered karst or cave-dwelling invertebrates known to occur in Bexar County, three species are known to occur in Stone Oak karst fauna region. The Property is not designated by the Service as Critical Habitat for any of the endangered karst invertebrates. Extensive karst surveys of the Property have not revealed the presence of any endangered karst invertebrate habitat or species (see Section 3.5).

#### **Edwards Aquifer Species**

The Service has expressed concern that the combined current level of water withdrawal for all consumers from the Edwards Aquifer could adversely affect aquifer-related species located at Comal, San Marcos, Fern Bank, and Hueco Springs during low flows, and that effects on the Aquifer may also affect the Cagle's map turtle (*G. caglei*) (a candidate for listing). Regional efforts are expected to address the potential impacts to aquifer-related species from water withdrawals (see Section 3.3.3). Impacts to water quality would be similar to those described under the Proposed Alternative.

#### **5.3.1.4 Wetlands**

Direct impacts to wetlands would be similar to those described under the Proposed Alternative.

#### **5.3.1.5 Geologic Features and Soils**

Direct impacts to geologic features and soils would be similar to those described under the Proposed Alternative.

#### **5.3.1.6 Land Use**

Direct impacts to land use would be similar to those described under the Proposed Alternative.

#### **5.3.1.7 Cultural Resources**

Direct impacts to cultural resources would be similar to those described under the Proposed Alternative.



#### **5.3.1.8 Air Quality**

Impacts to air quality would be similar to those described for the Proposed Alternative.

#### **5.3.1.9 Water Resources and Water Quality**

Development and construction of this alternative would be conducted in accordance with TCEQ rules for development on the Edwards Aquifer Recharge and Contributing Zones. No significant impacts to surface water or groundwater are expected due to this alternative. However, in this case results would be partially achieved by lower intensity development and by utilization of the TCEQ rules. One study identified the quantitative difference in constituent concentrations in storm water quality run-off coming from low intensity and high intensity communities has been shown to be small. The variation from event to event on the same test site is greater than the differences from site to site in nearly all cases (John Mancini, Director, National Urban Runoff Program Study Presentation - City of Austin Council Work Sessions transcripts, February 13, 14, and 16, 1984). To be conservative, the impervious cover percentage of this alternative is estimated to be approximately 5 percent less than the Proposed Alternative. An alternative community plan having less than 20 percent impervious cover requires no permanent best management practices per TCEQ rules. However, this plan considered certain BMPs in its concept plan, as well.

Annual water demand for the completed Alternative Three is estimated to be 453 equivalent dwelling units or 135,900 gallons per day (average flow).

#### **5.3.1.10 Socioeconomic Environment**

The proposed development, construction, and occupation of the Property would result in construction and operation of residential development with attendant roads and utilities on almost all portions of the Property. Development of this Property would provide additional residential areas. The construction of this alternative will result in the creation of significantly fewer construction jobs and no permanent jobs compared to the Proposed Alternative. In addition, the tax base created by development of this alternative will be significantly less than that for the Proposed Alternative or Alternative Two.

### **5.3.2 Indirect Impacts**

#### **5.3.2.1 Vegetation**

Indirect impacts to vegetation would be similar to those described under the Proposed Alternative.

#### **5.3.2.2 Wildlife**

Indirect impacts to wildlife would be similar to those described under the Proposed Alternative.

#### **5.3.2.3 Threatened or Endangered Species**

Indirect impacts to threatened and endangered species would be similar to those described under the Proposed Alternative.

#### **5.3.2.4 Wetlands**

Proposed on-site sedimentation controls will minimize the amount of sediment introduced into any drainage on-site or downstream. No indirect impacts to jurisdictional waters or wetlands are expected.

#### **5.3.2.5 Geologic Features and Soils**

No indirect impacts to geologic or soil resources are expected to occur.

#### **5.3.2.6 Land Use**

No significant indirect impacts to existing or proposed land uses are expected to occur as a result of the proposed action. Development of the Property will increase traffic on area roadways. At full build-out, Alternative Three is project to result in 340 AM peak hour trips and 458 PM peak hour trips with a total of 4,335 daily trips.

#### **5.3.2.7 Cultural Resources**

No increase in indirect impacts to cultural resources is expected.

#### **5.3.2.8 Air Quality**

Indirect impacts to air quality would be similar to those described for the Proposed Alternative.

#### **5.3.2.9 Water Resources and Water Quality**

Development will be conducted in accordance with TCEQ rules for development on the Edwards Aquifer Recharge and Contributing Zones. No significant indirect impacts to surface water or groundwater are expected due to Alternative Three.

#### **5.3.2.10 Socioeconomic Environment**

Alternative Three will result in an increase in residences in the area. This alternative may also result in an increase in supportive businesses such as stores and restaurants. There may also be an increase in the need for road repairs and other public services in the area, along with an increased tax base. However, the increase in tax base will be significantly lower than the Proposed Alternative or Alternative Two.

### **5.3.3 Cumulative Impacts Analysis**

A general overview of cumulative impacts is included as Section 5.1.3.

#### **5.3.3.1 Vegetation**

The approximate 2,675 total acres (1,083 hectares) of disturbed vegetation within Master Phase I and II would contribute to the cumulative disturbance of these vegetation types in Bexar County from development and other land use changes of all kinds. The majority of the open space within Master Phase I and II project areas would be in the form of privately owned large lots. Alternative Three would not exceed 15 percent impervious cover, providing for more overall green space than the Proposed Alternative or Alternative Two.

The majority of the heavy tree canopy cover areas within the Property would be unaltered during development under Alternative Three. However, these areas would not be part of a contiguous preserve as in the Proposed Alternative. Overall tree canopy for Alternative Three would likely remain over 45 percent due to the low percent impervious cover (<15 percent) of Alternative Three during construction, meeting the 45 percent recommended tree canopy for the EARZ. However, it can be anticipated that there would be extensive clearing of brush, undergrowth, and vegetation located within the lot boundaries. Homeowners often consider such vegetation to be a fire hazard and undesirable in proximity to homes.

#### **5.3.3.2 Wildlife**

The proposed action would contribute to a cumulative reduction of habitat for some wildlife species when added to impacts from development and other land uses in Bexar County. Wildlife species better adapted to urban and suburban habitat (generalists) may increase and exacerbate displacement of species intolerant to development, which may decrease locally. However, because a viable amount of wildlife habitat will be maintained through this large lot plan, the overall cumulative effect is more likely insignificant. Therefore, no significant impacts to wildlife species in Bexar County or the region are expected.

#### **5.3.3.3 Threatened or Endangered Species**

Cumulatively, the proposed action may contribute to take of GCWAs and will reduce the overall habitat for the GCWA in Bexar County, particularly when added to other section 10(a)(1)(B) incidental take permits that may be issued by the Service and for other developments that have not obtained authorization under the ESA.

With the exception of the GCWA, cumulative impacts to threatened or endangered species would be similar to those described under the Proposed Alternative (See Section 5.1.3.4). No endangered karst invertebrates were identified on-site. Therefore, no cumulative impacts to karst invertebrates are anticipated as a result of Alternative Two.

No Service designated Critical Habitat exists on-site.

#### **5.3.3.4 Wetlands**

Cumulative impacts to wetlands would be similar to those described under the Proposed Alternative.



**5.3.3.5 Geologic Features and Soils**

Cumulative impacts to geologic features and soils would be similar to those described under the Proposed Alternative.

**5.3.3.6 Land Use**

Cumulative impacts to land use would be similar to those described under the Proposed Alternative.

**5.3.3.7 Cultural Resources**

Cumulative impacts to cultural resources would be similar to those described under the Proposed Alternative.

**5.3.3.8 Air Quality**

Cumulative impacts to air quality would be similar to those described for the Proposed Alternative.

**5.3.3.9 Water Resources and Water Quality**

Development will be conducted in accordance with TCEQ rules for development on the Edwards Aquifer Recharge and Contributing Zones. No significant impacts to surface water or groundwater are expected due to the proposed development.

**5.3.3.10 Socioeconomic Environment**

Cumulative impacts to socioeconomic Environment would be similar to those described under the Proposed Alternative.

**5.4 Alternative Four - No Action**

Under this alternative LIC would not develop the Property. As such, no additional impacts to the GCWA would occur as a result. Abandonment of the Proposed Alternative would result in the loss of significant monies invested by LIC in the Property and would be economically impractical for them. In addition, as the owner of the Property, LIC is responsible for maintenance of the Property, including taxes and upkeep. Given the expenses already incurred, LIC would suffer tremendous losses if prevented from developing the Property. Accordingly, this alternative was not considered to be practicable. The sale of the Property for purposes other than development is not economically feasible.

**5.5 Public and Agency Participation**

The Applicant has stated it has been actively pursuing public and agency acceptance of the proposed development, and will be making significant efforts through numerous meetings with

concerned groups, individuals, public officials, and agencies, to properly coordinate this proposed action.

The following agencies, organizations, and individuals have been or will be consulted or coordinated with during the process of addressing endangered species concerns for the Property:

Robert Pine, Scott Rowin, and Carrie Thompson, U.S. Fish & Wildlife Service  
U.S. Fish and Wildlife Service, Albuquerque, New Mexico  
Barrett D. Allison, P. E., Environmental & Planning and Associates  
Steve Paulson, Stacy Nipper, aci consulting  
Alan Glen, Smith, Robertson, Elliott & Glen, LLP  
Cara Tackett, P.E., Ruben Cervantes, P.E., and Phil Pearce, P.G. Pape-Dawson Engineers, Inc.  
Lee Sherrod, Horizon Environmental Services  
Mike Warton, Mike Warton & Associates  
The Nature Conservancy of Texas

Geologic interpretation presented in Sections 3.5, 3.7.2, and 5.1.1.9 was prepared by Philip C. Pearce, P.G., of Pape-Dawson Engineers, Inc. The geoscientist seal affixed to this document applies to these referenced sections only.